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भारतीय मानक

स्वचल वाहन — संयोजन के लिये परीक्षण पद्धति

(पहला पुनरीक्षण)

Indian Standard

AUTOMOTIVE VEHICLES — METHOD OF TEST FOR ARTICULATION

(First Revision)

ICS 43.040.60; 19.060

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

July 2013 **Price Group 2**

Automotive Braking Systems, Vehicle Testing and Performance Evaluation Sectional Committee, TED 04

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Braking Systems, Vehicle Testing and Performance Evaluation Sectional Committee had been approved by the Transport Engineering Division Council.

The overall performance of an automotive vehicle is a function of the performance of its various components, systems, etc. The performance of a vehicle should not deteriorate even in adverse conditions of operation of the vehicle. The value of articulation height given in this standard will be reviewed as and when further data would be available. The standard gives a uniform method to establish the height of articulation achievable by an automotive vehicle.

This standard was first published in 1992. This revision has been taken up for updating based on latest developments in the field.

The composition of the Committee responsible for the formulation of this standard is given in Annex B.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

AUTOMOTIVE VEHICLES — METHOD OF TEST FOR ARTICULATION

(First Revision)

1 SCOPE

This standard specifies the method of test for articulation of M & N category vehicles as defined in IS 14272 : 2011 'Automotive vehicles — Types — Terminology (*first revision*)'.

2 TERMINOLOGY

For the purpose of this standard the following definitions shall apply.

2.1 Height of Articulation

2.1.1 *For 2 Axle Vehicles* **—** It is the maximum height to which the diagonally opposite wheels to be raised till one of the remaining wheels starts lifting up or the suspension is compressed to the maximum limit allowed by the stoppers, if provided.

2.1.2 *For Vehicles with More than 2 Axles* **—** It is the maximum height to which the farthest and innermost diagonally opposite wheels to be raised till one of the remaining wheels starts lifting up or the suspension is compressed to the maximum limit allowed by the stoppers, if provided.

3 PREPARATION OF THE VEHICLE

3.1 The vehicle shall conform in all its parts and components to the design and/or production series as applicable.

3.2 The tyres fitted on the vehicle shall not have done more than 10 percent of its life and shall be inflated to the pressure recommended by the vehicle manufacturer. Tread depth measurement may be used to assess tyre life.

3.3 The vehicle shall be loaded to the manufacturers' maximum total weight and the load distribution between the axles shall be as recommended by the manufacturer and the articulation test may be carried out in unladen condition also. .

4 TEST PROCEDURE

4.1 The vehicle shall be placed on a level surface. In case of two axled vehicles, the diagonally opposite wheels and for vehicles with more than two axles, the farthest and innermost wheels shall be raised up by equal amounts by jacking directly under the wheel. Alternatively, these wheels may be raised from the ground and suitable planks placed under the wheel. The wheels may then be lowered or any other method by which the diagonally opposite wheels shall be raised by equal height from the ground may be followed. The lifting shall be done till the conditions given in **2.1** are established. The maximum articulation height shall be measured and recorded according to Annex A.

4.2 The following operations shall be checked with above mentioned conditions of the vehicle:

a) Closing and opening of doors;
b) Closing and opening of bonnet cover; and
c) Functioning of controls like clutch, brake and accelerator pedals, change speed operation in stationary condition without fouling of their respective linkages.

4.3 The following observations shall be made when the vehicle is in the articulated condition as in **4.1**.

a) Fouling of brake lines or fuel lines against chassis frame cross members, etc;
b) Observation of any cracks on the chassis frame, cross members, etc;
c) Fouling of steering linkages with wheels, load springs or brake pipings;
d) Observation of any leakages, cracks on shock absorbers;
e) Closing and opening of luggage compartment or enclosed loading compartment; and
f) Fouling of fan-cowl/ring while starting the engine.

4.4 The above test shall be repeated for the other pair of diagonally opposite wheels in fully laden condition and articulation test may be carried out in unladen condition.

ANNEX A

(*Clause* 4.1)

Test Results

Sl No.	*Vehicle Parameters*	*Observation*
1.	Vehicle configuration	
2.	Number of axles (Steered/Non-steered)	
3.	Tyre pressure (PSI/kPa)	
4.	Tread depth (mm)	
5.	Maximum gross vehicle weight (kg)	
6.	Maximum permissible axle weights (kg) (FAW1/FAW2/RAW3/RAW4)	
7.	Unladen front axle weight (kg) (FAW1/FAW2)	
8.	Unladen rear axle weight (kg) (RAW1/RAW2)	
9.	Articulation height (mm):	
	a) shall not be less than 200 mm for off road vehicles (like tippers)	
	b) shall not be less than 150 mm for other vehicles	
10.	Lift of farthest diagonally opposite wheels for all vehicles (mm):	
	a) RH Front and LH Rear	
	b) LH Front and RH Rear	
11.	Lift of innermost diagonally opposite wheels for vehicles with more than two axles (mm):	
	a) RH Front and LH Rear	
	b) LH Front and RH Rear	
12.	Parameters to be checked in articulated condition (Clearances as observed by OEMs):	
	a) Opening and closing of doors/bonnet cover/luggage compartment	
	b) Functioning of clutch pedals/brake pedals/accelerator pedals	
	c) Starting and stopping of engine	
	d) Fouling of brake lines/fuel lines/exhaust line/electrical line/steering line with chassis frame and cross members	
	e) Any cracks observed on chassis frame, cross members (Y/N)	
	f) Fouling of steering linkages with wheels/leaf springs/shock absorber pipings/wiring (Y/N)	
	g) Any deformation/fouling/leakage observed on shock absorbers/Track rod/drag link (Y/N)	

ANNEX B

(*Foreword*)

COMMITTEE COMPOSITION

Automotive Braking Systems, Vehicle Testing and Performance Evaluation Sectional Committee, TED 4

Organization	*Representative(s)*
National Automotive Testing and R&D Infrastructure Project (NATRIP), Indore	DR N. KARUPPAIAH (***Chairman***)
Ashok Leyland Ltd, Chennai	SHRI S. ARUN SHRI A. JOSEPH SELVARAJ (*Alternate*)
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Automotive Research Association of India, Pune	SHRI S. S. SANDHU SHRI A. AKBAR BADUSHA (*Alternate*)
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Brakes India Ltd, Chennai	SHRI P. VENUGOPAL SHRI K. N. BALAJI (*Alternate*)
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Organization	*Representative(s)*
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Member Secretary

SHRI P. S. MUJRAL
Scientist ‘E’ (TED), BIS

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